Paper #1 Abstract

Title
Adding Parameter Guidance of Heterogeneity of Treatment Effects to an Online Design Parameter Database

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Background
Randomized evaluations of education interventions are now the standard for evaluations because of their strong casual inference properties. In many (if not most) cases, these studies are multilevel in nature due to the sampling and/or intervention design. For example, entire clusters such as schools may be randomized to a treatment arm. When issues of contamination can be controlled, another common practice is to randomize students into treatment arms within schools. Such "randomized block designs" have the attractive property of requiring less schools (assuming the student sample is the same) to achieve the same level of statistical power and is sometimes more palatable to practitioners because all schools receive some level of treatment.

To design any randomized experiment, a thorough power analysis is required which requires some a priori design parameters such as the effect size and the population intraclass correlations. Randomized block designs, however, also require information on how the treatment effect itself varies across clusters (Hedges and Rhoads 2010). Unfortunately, there is little guidance about the treatment effect heterogeneity parameters often employed by power analysis software such as Optimal Design (Raudenbush, et al. 2011) and CRT Power (Borenstein, et al. 2012).

Purpose
The purpose of this paper is to showcase new research that seeks to provide guidance on the heterogeneity of treatment effects by utilizing the variance of demographic differences in state assessments. The estimated parameters in this paper (among others) will be part of an online database of design parameters that can be accessed freely by the research community as they use typical power-calculation software such as OD and CRT Power.

Research Design
This study is focused on a simple randomized block design where students are nested within schools, and within each school students are randomized into treatment or control conditions. Thus, the statistical model for analysis (without controls) is

$$y_{ij} = \gamma_0 + \gamma_1 T_{ij} + u_0 + u_1 T_{ij} + e_{ij},$$

where γ_i is an estimate of the difference in means between treatment and control, u_0 is the school-level random effect of the school mean, distributed normal with a mean of 0 and a variance σ_2^2, u_1 is the school-level random effect of the treatment difference, distributed normal with a mean of 0 and variance τ^2, and e_{ij} is the within-school residual distributed normal with a mean of 0 and variance σ_1^2.

Most software to compute the power, minimum detectable effects, or necessary sample sizes, for randomized block designs require either one of two parameters that describe the heterogeneity of the treatment effect across clusters (Spybrook, et al. 2014). First, software such as OD requires a measure of the effect size variance (ESV), which is defined as

$$ESV = \frac{\tau^2}{\sigma_1^2}.$$

Second, software such as CRT Power require a different parameter, a ratio of the treatment effect variance to the cluster-mean variance, noted as the ω ratio, defined as

$$\omega = \frac{\tau^2}{\sigma_2^2}.$$

Another important note is that the two software packages utilize different effect size measures, with OD standardizing the difference in means with only the within-school variance,

$$\delta_{OD} = \frac{\gamma_1}{\sigma_1},$$

whereas CRT Power employs both the within-school and cluster level mean variance,

$$\delta_{CRTP} = \frac{\gamma_1}{\sqrt{\sigma_1^2+\sigma_2^2}}.$$

Unlike variance decomposition parameters that relate to a population parameter net (and independent) of a treatment effect, treatment effect heterogeneity parameters by their very nature are dependent on the interventions themselves, how efficacious they are, and the variation in the effects across sites. This makes a database of these values difficult to compile, and even if it were collected, the parameters may not be useful for a new intervention. However, some guidance is warranted for responsible experimental design.

We propose that many evaluations are designed to close demographic differences in achievement, such as the difference in reading achievement between low SES and higher SES students. Thus, a possible upper-bound to the effect size (and the heterogeneity of the effect) for such interventions may be the effect size and the heterogeneity of the effect of the demographic difference itself. These parameters can be scaled to the proportion of the gap likely to be reduced by the intervention.

Thus, we estimate several mixed models that estimate the difference in math and reading achievement tests between various demographic contrasts (coding one group as 0.5 and the other group as -0.5):

- Black vs White students
- Hispanic vs. White students
- Free/Reduced price lunch eligible students vs. students who are not eligible

The models also estimate the random effect of the demographic difference. With these models we then calculate the heterogeneity parameters.

Data Collection

The data we utilize come from several states: Arizona, Arkansas, Colorado, Illinois, Kentucky, Louisiana, Massachusetts, Minnesota, North Carolina, West Virginia, and Wisconsin. From these states, we examined the difference between demographic groups in grades 3-8 in both math and reading scores. While the online resource will include all these grades and subjects, we present tables here for 4^{th} and 8^{th} grade only for brevity.

Findings/Results

Figure 1 through 4 give a general sense of the distribution of the parameters across states and grades for each contrast and subject. The titles in the subgraphs provide the means and standard deviations of the parameters. For example, looking at the effect sizes (for both OD and CRT Power use), Black students trail White students by about half a standard deviation while Hispanic students trail White students by about a third of a standard deviation. On average, the ESV parameters tend to be small, about or below 0.1 on average, while the omega ratio has a bit more variety.

Tables 1-12 present example parameters. For reference, we include the overall rate of the focal group (Black, Hispanic, Free and reduced price lunch eligible) in the grade-subject population, and the rate when only that group and its reference are considered (this rate is the same for the SES lunch status contrast).

The effect sizes and parameters in these tables (and online resource) can be scaled by the user to be proportional to the effective reduction in these gaps the interventions seek to make.

References

Borenstein, M., Hedges, L. V., & Rothstein, H. (2012). CRT Power. *Teaneck, NJ: Biostat*.

Hedges, L. V., & Rhoads, C. (2010). Statistical Power Analysis in Education Research. NCSER 2010-3006. *National Center for Special Education Research*

Raudenbush, S. W., Spybrook, J., Congdon, R., Liu, X. F., Martinez, A., & Bloom, H. (2011). Optimal design software for multi-level and longitudinal research (Version 3.01)[Software]. *Available from www. wtgrantfoundation.org*.

Spybrook, J., Hedges, L., & Borenstein, M. (2014). Understanding Statistical Power in Cluster Randomized Trials: Challenges Posed by Differences in Notation and Terminology. *Journal of Research on Educational Effectiveness, 7*(4), 384-406.

Tables and Figure

Figure 1: Distribution of effect sizes (for OD) for all states and grades estimated

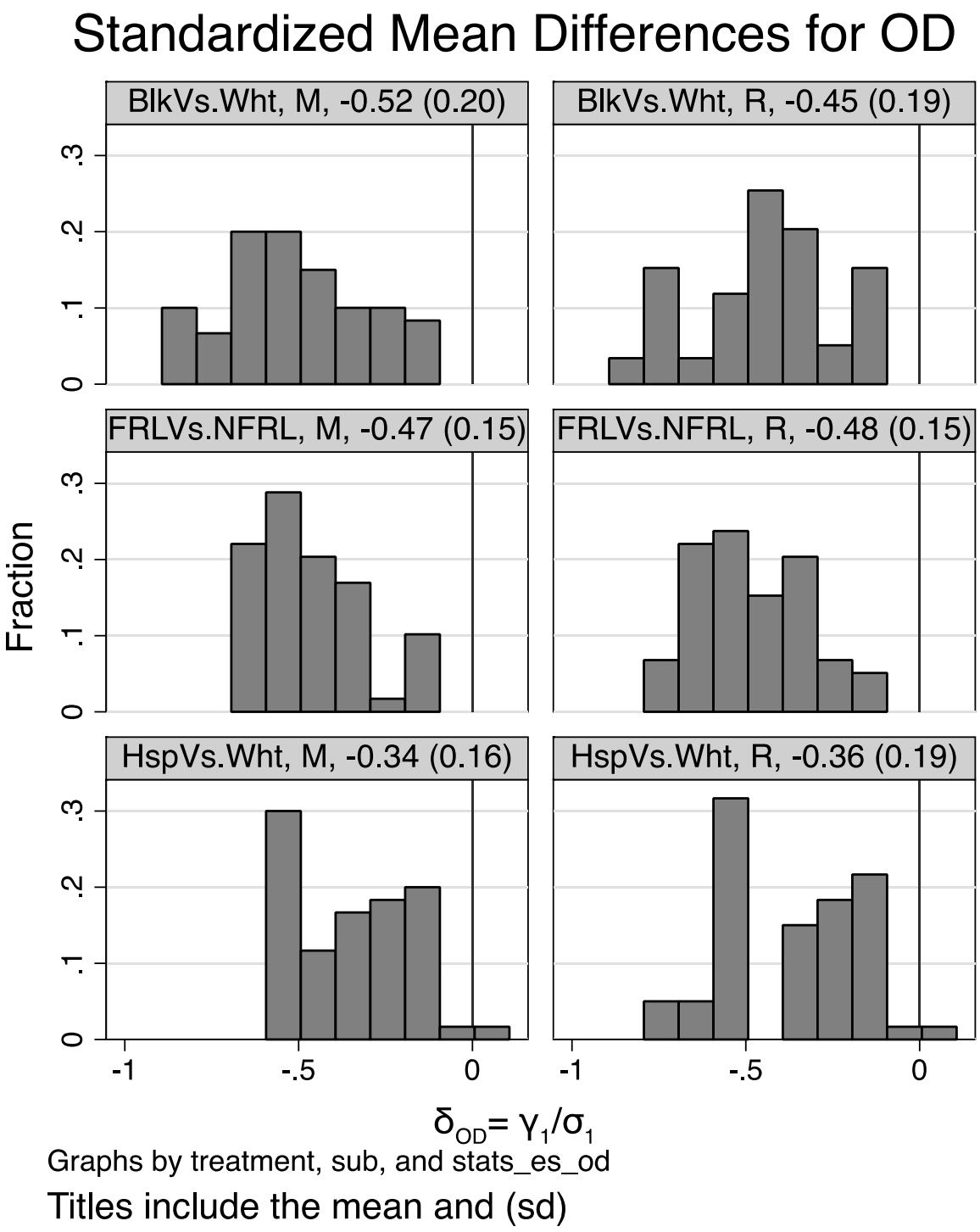

Figure 2: Distribution of effect sizes (for CRT Power) for all states and grades estimated

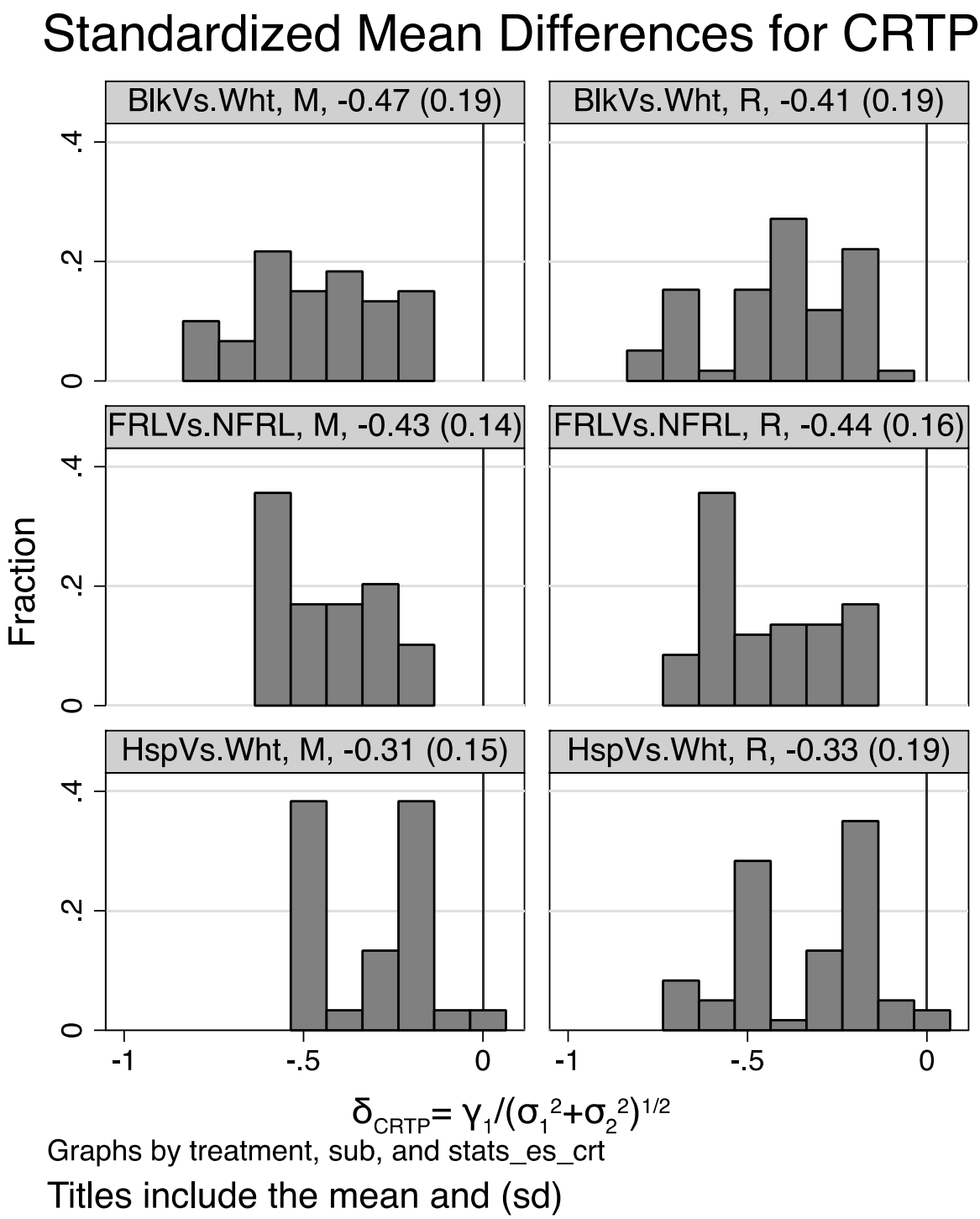

Figure 3: Distribution of estimated effect size variances for all states and grades

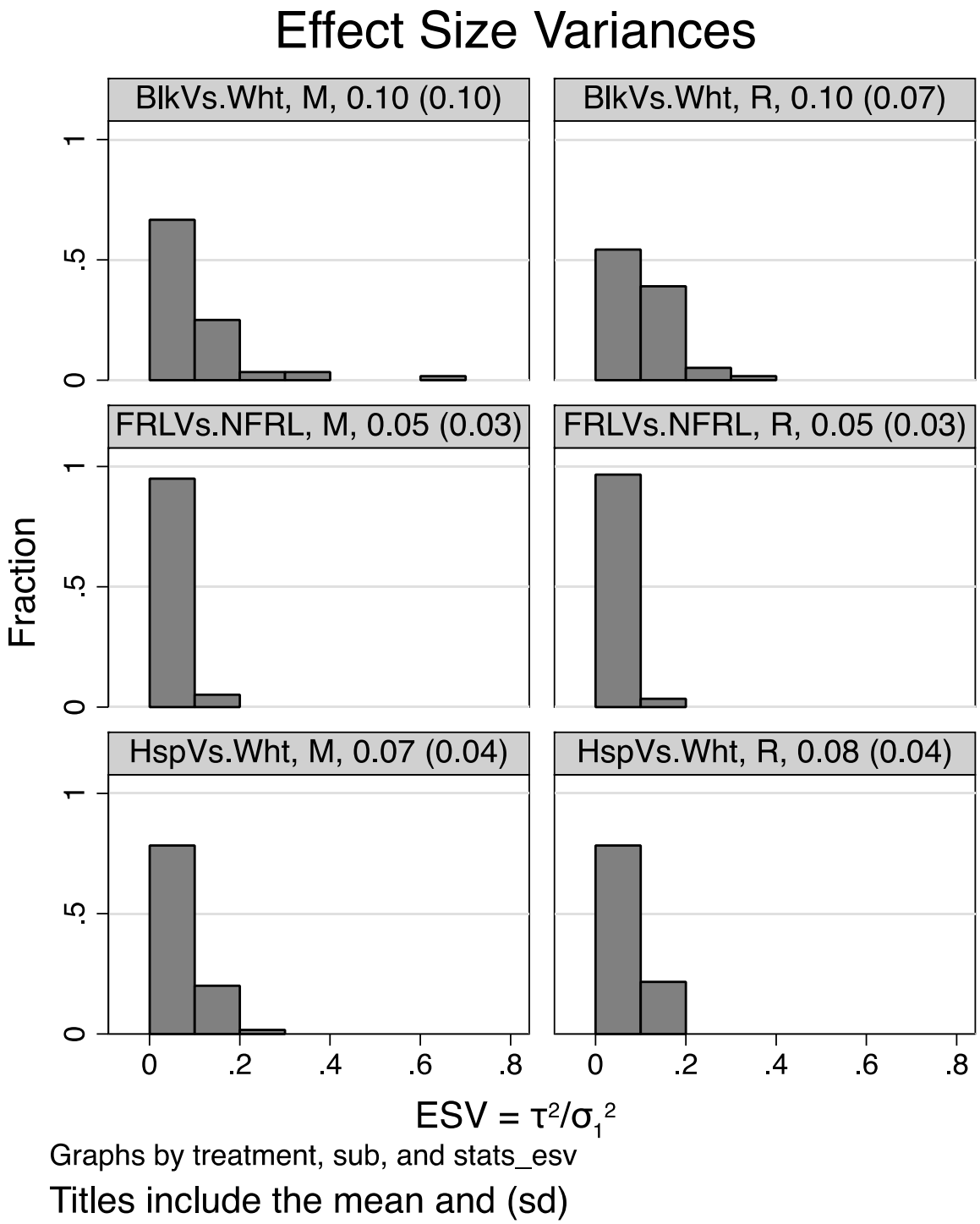

Figure 4: Distribution of estimated omega ratios for all states and grades

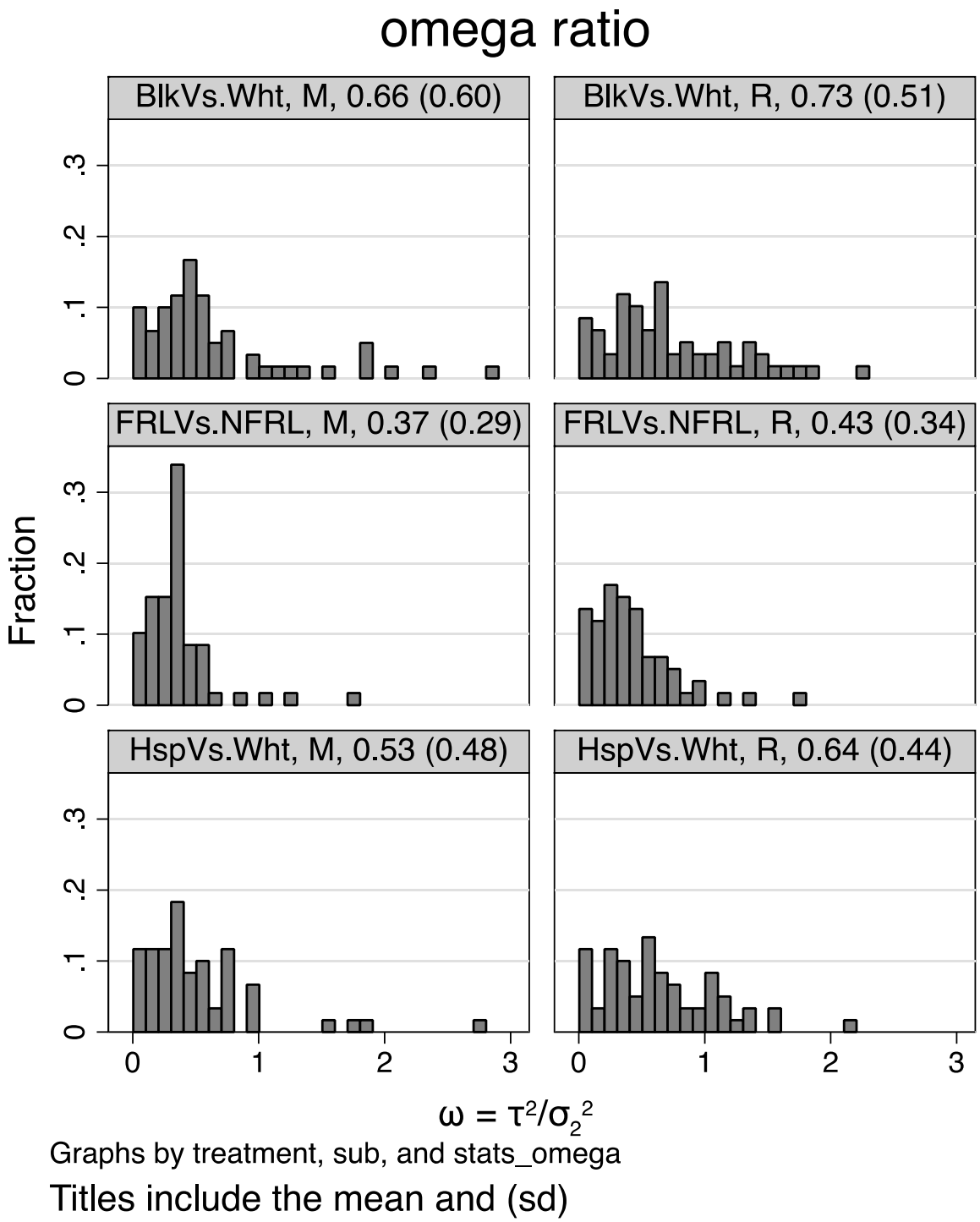

Table 1: Effect size and Heterogeneity Parameters for Black vs. White in math scores for grade 4

	Rates of focal group		For use with Optimal Design				For use with CRT Power			
	Overall	Model	Effect size		Effect size variance		Effect size		Omega ratio	
AZ	0.06	0.11	-0.185	(0.021)	0.090	(0.018)	-0.178	(0.020)	1.180	(0.231)
CO	0.07	0.11	-0.679	(0.024)	0.094	(0.019)	-0.625	(0.022)	0.522	(0.106)
IL	0.17	0.24	-0.456	(0.020)	0.270	(0.026)	-0.330	(0.015)	0.298	(0.031)
KY	0.11	0.11	-0.602	(0.022)	0.059	(0.012)	-0.562	(0.021)	0.403	(0.086)
LA	0.47	0.50	-0.456	(0.013)	0.025	(0.006)	-0.429	(0.013)	0.192	(0.048)
MA	0.09	0.12	-0.560	(0.018)	0.051	(0.012)	-0.525	(0.017)	0.367	(0.092)
MN	0.11	0.13	-0.485	(0.025)	0.160	(0.026)	-0.407	(0.021)	0.376	(0.060)
NC	0.25	0.30	-0.752	(0.012)	0.071	(0.007)	-0.714	(0.011)	0.641	(0.069)
WI	0.10	0.12	-0.861	(0.023)	0.111	(0.018)	-0.818	(0.022)	1.037	(0.175)
WV	0.05	0.05	-0.257	(0.044)	0.089	(0.051)	-0.251	(0.043)	1.826	(0.718)

Note: parameter standard errors in parentheses.

Table 2: Effect size and Heterogeneity Parameters for Hispanic vs. White in math scores for grade 4

	Rates of focal group		For use with Optimal Design				For use with CRT Power			
	Overall	Model	Effect size		Effect size variance		Effect size		Omega ratio	
AZ	0.41	0.47	-0.153	(0.012)	0.039	(0.006)	-0.149	(0.011)	0.720	(0.115)
CO	0.33	0.37	-0.529	(0.014)	0.057	(0.008)	-0.491	(0.013)	0.349	(0.051)
IL	0.26	0.33	-0.325	(0.012)	0.074	(0.009)	-0.227	(0.009)	0.071	(0.009)
KY	0.03	0.04	-0.309	(0.032)	0.081	(0.025)	-0.287	(0.030)	0.523	(0.161)
LA	0.04	0.08	-0.205	(0.026)	0.037	(0.018)	-0.193	(0.024)	0.291	(0.141)
MA	0.14	0.16	-0.525	(0.018)	0.063	(0.011)	-0.485	(0.017)	0.364	(0.068)
MN	0.08	0.10	-0.342	(0.023)	0.107	(0.025)	-0.303	(0.020)	0.384	(0.105)
NC	0.12	0.17	-0.502	(0.015)	0.103	(0.010)	-0.478	(0.014)	0.975	(0.111)
WI	0.09	0.11	-0.515	(0.020)	0.066	(0.013)	-0.495	(0.019)	0.786	(0.166)
WV	0.01	0.01	-0.228	(0.065)	0.000	(0.000)	-0.224	(0.064)	0.005	(0.000)

Note: parameter standard errors in parentheses.

Table 3: Effect size and Heterogeneity Parameters for FRPL vs. Not FRPL in math scores for grade 4

	Rates of focal group		For use with Optimal Design				For use with CRT Power			
	Overall	Model	Effect size		Effect size variance		Effect size		Omega ratio	
AZ	0.58	0.58	-0.180	(0.009)	0.009	(0.003)	-0.176	(0.009)	0.178	(0.073)
CO	0.44	0.44	-0.590	(0.013)	0.049	(0.007)	-0.551	(0.012)	0.337	(0.049)
IL	0.53	0.53	-0.406	(0.010)	0.070	(0.006)	-0.288	(0.007)	0.071	(0.007)
KY	0.57	0.57	-0.569	(0.012)	0.026	(0.005)	-0.534	(0.012)	0.192	(0.040)
LA	0.76	0.76	-0.434	(0.014)	0.027	(0.006)	-0.405	(0.013)	0.180	(0.043)
MA	0.34	0.34	-0.590	(0.013)	0.051	(0.007)	-0.551	(0.012)	0.352	(0.053)
MN	0.40	0.40	-0.384	(0.012)	0.047	(0.008)	-0.324	(0.011)	0.118	(0.021)
NC	0.52	0.52	-0.663	(0.011)	0.073	(0.006)	-0.626	(0.010)	0.597	(0.052)
WI	0.41	0.41	-0.583	(0.012)	0.056	(0.007)	-0.552	(0.012)	0.498	(0.071)
WV	0.57	0.57	-0.424	(0.016)	0.009	(0.006)	-0.418	(0.015)	0.330	(0.235)

Note: parameter standard errors in parentheses.

Table 4: Effect size and Heterogeneity Parameters for Black vs. White in math scores for grade 8

	Rates of focal group		For use with Optimal Design				For use with CRT Power			
	Overall	Model	Effect size		Effect size variance		Effect size		Omega ratio	
AZ	0.06	0.11	-0.224	(0.017)	0.005	(0.008)	-0.217	(0.017)	0.080	(0.138)
CO	0.07	0.10	-0.552	(0.029)	0.076	(0.016)	-0.505	(0.027)	0.394	(0.085)
IL	0.18	0.25	-0.512	(0.017)	0.091	(0.015)	-0.362	(0.013)	0.090	(0.015)
KY	0.10	0.10	-0.591	(0.027)	0.059	(0.012)	-0.561	(0.026)	0.528	(0.119)
LA	0.45	0.48	-0.316	(0.015)	0.023	(0.006)	-0.284	(0.014)	0.097	(0.026)
MA	0.09	0.11	-0.543	(0.022)	0.066	(0.012)	-0.506	(0.020)	0.439	(0.087)
MN	0.09	0.11	-0.338	(0.029)	0.151	(0.031)	-0.314	(0.028)	0.972	(0.146)
NC	0.27	0.31	-0.667	(0.017)	0.096	(0.009)	-0.600	(0.015)	0.413	(0.046)
WI	0.10	0.11	-0.880	(0.028)	0.099	(0.020)	-0.826	(0.026)	0.732	(0.157)
WV	0.05	0.05	-0.346	(0.089)	0.660	(0.209)	-0.312	(0.081)	2.879	(0.331)

Note: parameter standard errors in parentheses.

Table 5: Effect size and Heterogeneity Parameters for Hispanic vs. White in math scores for grade 8

	Rates of focal group		For use with Optimal Design				For use with CRT Power			
	Overall	Model	Effect size		Effect size variance		Effect size		Omega ratio	
AZ	0.39	0.46	-0.143	(0.013)	0.035	(0.006)	-0.138	(0.013)	0.488	(0.089)
CO	0.30	0.34	-0.479	(0.016)	0.039	(0.007)	-0.438	(0.015)	0.202	(0.037)
IL	0.24	0.31	-0.330	(0.014)	0.079	(0.011)	-0.224	(0.010)	0.068	(0.010)
KY	0.03	0.03	-0.216	(0.038)	0.063	(0.022)	-0.206	(0.036)	0.630	(0.233)
LA	0.04	0.07	-0.159	(0.030)	0.050	(0.017)	-0.142	(0.027)	0.199	(0.079)
MA	0.12	0.14	-0.538	(0.021)	0.058	(0.011)	-0.496	(0.020)	0.328	(0.067)
MN	0.06	0.08	-0.215	(0.028)	0.103	(0.025)	-0.203	(0.026)	0.802	(0.160)
NC	0.10	0.14	-0.447	(0.018)	0.092	(0.011)	-0.410	(0.017)	0.481	(0.069)
WI	0.07	0.09	-0.549	(0.023)	0.048	(0.012)	-0.522	(0.022)	0.458	(0.123)
WV	0.01	0.01	-0.099	(0.073)	0.017	(0.045)	-0.097	(0.072)	0.728	(1.473)

Note: parameter standard errors in parentheses.

Table 6: Effect size and Heterogeneity Parameters for FRPL vs. Not FRPL in math scores for grade 8

	Rates of focal group		For use with Optimal Design				For use with CRT Power			
	Overall	Model	Effect size		Effect size variance		Effect size		Omega ratio	
AZ	0.54	0.54	-0.159	(0.012)	0.031	(0.005)	-0.154	(0.012)	0.393	(0.071)
CO	0.39	0.39	-0.539	(0.016)	0.052	(0.007)	-0.496	(0.015)	0.290	(0.044)
IL	0.51	0.51	-0.407	(0.011)	0.058	(0.006)	-0.281	(0.008)	0.052	(0.006)
KY	0.54	0.54	-0.590	(0.017)	0.046	(0.006)	-0.559	(0.016)	0.403	(0.067)
LA	0.70	0.70	-0.312	(0.012)	0.009	(0.004)	-0.278	(0.011)	0.033	(0.014)
MA	0.32	0.32	-0.571	(0.018)	0.090	(0.010)	-0.529	(0.017)	0.545	(0.071)
MN	0.36	0.36	-0.307	(0.017)	0.113	(0.014)	-0.294	(0.017)	1.263	(0.142)
NC	0.48	0.48	-0.605	(0.014)	0.083	(0.007)	-0.540	(0.013)	0.321	(0.033)
WI	0.36	0.36	-0.598	(0.014)	0.042	(0.006)	-0.556	(0.013)	0.269	(0.044)
WV	0.52	0.52	-0.382	(0.015)	0.004	(0.004)	-0.378	(0.015)	0.211	(0.220)

Note: parameter standard errors in parentheses.

Table 7: Effect size and Heterogeneity Parameters for Black vs. White in reading scores for grade 4

	Rates of focal group		For use with Optimal Design				For use with CRT Power			
	Overall	Model	Effect size		Effect size variance		Effect size		Omega ratio	
AZ	0.06	0.11	-0.186	(0.021)	0.084	(0.017)	-0.179	(0.020)	1.134	(0.229)
CO	0.07	0.11	-0.511	(0.024)	0.102	(0.020)	-0.473	(0.022)	0.622	(0.119)
IL	0.17	0.24	-0.365	(0.020)	0.286	(0.027)	-0.264	(0.015)	0.311	(0.031)
KY	0.11	0.11	-0.471	(0.022)	0.048	(0.011)	-0.443	(0.020)	0.362	(0.088)
LA	0.47	0.50	-0.292	(0.013)	0.016	(0.005)	-0.281	(0.012)	0.189	(0.063)
MA	0.09	0.11	-0.511	(0.020)	0.080	(0.014)	-0.467	(0.018)	0.409	(0.077)
MN	0.11	0.13	-0.429	(0.026)	0.182	(0.026)	-0.357	(0.022)	0.405	(0.059)
NC	0.25	0.30	-0.746	(0.012)	0.070	(0.007)	-0.717	(0.011)	0.856	(0.092)
WI	0.10	0.12	-0.714	(0.024)	0.147	(0.022)	-0.681	(0.023)	1.497	(0.214)
WV	0.05	0.05	-0.180	(0.049)	0.148	(0.060)	-0.173	(0.047)	1.824	(0.505)

Note: parameter standard errors in parentheses.

Table 8: Effect size and Heterogeneity Parameters for Hispanic vs. White in reading scores for grade 4

	Rates of focal group		For use with Optimal Design				For use with CRT Power			
	Overall	Model	Effect size		Effect size variance		Effect size		Omega ratio	
AZ	0.41	0.47	-0.190	(0.011)	0.038	(0.006)	-0.185	(0.011)	0.759	(0.120)
CO	0.32	0.37	-0.510	(0.014)	0.073	(0.009)	-0.476	(0.014)	0.494	(0.064)
IL	0.26	0.33	-0.304	(0.013)	0.085	(0.010)	-0.212	(0.009)	0.081	(0.010)
KY	0.03	0.04	-0.165	(0.032)	0.081	(0.026)	-0.155	(0.030)	0.641	(0.200)
LA	0.04	0.08	-0.184	(0.026)	0.048	(0.018)	-0.176	(0.025)	0.552	(0.214)
MA	0.13	0.16	-0.537	(0.019)	0.071	(0.012)	-0.483	(0.017)	0.299	(0.054)
MN	0.08	0.10	-0.338	(0.025)	0.166	(0.031)	-0.294	(0.022)	0.508	(0.114)
NC	0.12	0.17	-0.720	(0.015)	0.108	(0.011)	-0.692	(0.015)	1.298	(0.149)
WI	0.09	0.10	-0.557	(0.021)	0.087	(0.015)	-0.536	(0.021)	1.066	(0.182)
WV	0.01	0.01	-0.200	(0.074)	0.061	(0.074)	-0.195	(0.072)	1.114	(1.123)

Note: parameter standard errors in parentheses.

Table 9: Effect size and Heterogeneity Parameters for FRPL vs. Not FRPL in reading scores for grade 4

	Rates of focal group		For use with Optimal Design				For use with CRT Power			
	Overall	Model	Effect size		Effect size variance		Effect size		Omega ratio	
AZ	0.58	0.58	-0.209	(0.009)	0.008	(0.003)	-0.204	(0.009)	0.176	(0.075)
CO	0.44	0.44	-0.596	(0.013)	0.057	(0.007)	-0.563	(0.012)	0.466	(0.063)
IL	0.53	0.53	-0.379	(0.010)	0.067	(0.006)	-0.267	(0.007)	0.066	(0.007)
KY	0.57	0.57	-0.511	(0.012)	0.021	(0.005)	-0.484	(0.011)	0.183	(0.044)
LA	0.76	0.76	-0.390	(0.013)	0.019	(0.005)	-0.374	(0.013)	0.221	(0.065)
MA	0.34	0.34	-0.652	(0.013)	0.056	(0.008)	-0.597	(0.013)	0.286	(0.042)
MN	0.40	0.40	-0.351	(0.012)	0.040	(0.008)	-0.308	(0.011)	0.136	(0.028)
NC	0.52	0.52	-0.701	(0.011)	0.073	(0.006)	-0.673	(0.010)	0.858	(0.078)
WI	0.41	0.41	-0.622	(0.013)	0.066	(0.008)	-0.597	(0.012)	0.790	(0.105)
WV	0.57	0.57	-0.446	(0.016)	0.009	(0.007)	-0.439	(0.015)	0.269	(0.201)

Note: parameter standard errors in parentheses.

Table 10: Effect size and Heterogeneity Parameters for Black vs. White in reading scores for grade 8

	Rates of focal group		For use with Optimal Design				For use with CRT Power			
	Overall	Model	Effect size		Effect size variance		Effect size		Omega ratio	
CO	0.07	0.10	-0.478	(0.029)	0.082	(0.017)	-0.443	(0.027)	0.500	(0.109)
IL	0.18	0.25	-0.353	(0.019)	0.102	(0.020)	-0.209	(0.011)	0.055	(0.011)
KY	0.10	0.10	-0.434	(0.027)	0.053	(0.011)	-0.413	(0.025)	0.508	(0.121)
LA	0.45	0.48	-0.296	(0.015)	0.022	(0.006)	-0.269	(0.013)	0.101	(0.029)
MA	0.09	0.11	-0.457	(0.022)	0.066	(0.012)	-0.417	(0.020)	0.327	(0.068)
MN	0.09	0.11	-0.334	(0.030)	0.171	(0.035)	-0.309	(0.028)	0.982	(0.151)
NC	0.27	0.31	-0.761	(0.015)	0.072	(0.007)	-0.712	(0.015)	0.501	(0.061)
WI	0.10	0.11	-0.791	(0.028)	0.109	(0.020)	-0.754	(0.027)	1.084	(0.198)
WV	0.05	0.05	-0.269	(0.075)	0.393	(0.178)	-0.248	(0.069)	2.209	(0.413)

Note: parameter standard errors in parentheses.

Table 11: Effect size and Heterogeneity Parameters for Hispanic vs. White in reading scores for grade 8

	Rates of focal group		For use with Optimal Design				For use with CRT Power			
	Overall	Model	Effect size		Effect size variance		Effect size		Omega ratio	
AZ	0.39	0.46	-0.175	(0.013)	0.037	(0.006)	-0.170	(0.013)	0.612	(0.109)
CO	0.30	0.34	-0.518	(0.018)	0.061	(0.008)	-0.478	(0.017)	0.345	(0.055)
IL	0.24	0.31	-0.285	(0.014)	0.062	(0.011)	-0.160	(0.008)	0.028	(0.005)
KY	0.03	0.03	-0.130	(0.038)	0.063	(0.021)	-0.124	(0.036)	0.648	(0.231)
LA	0.04	0.07	-0.216	(0.033)	0.090	(0.023)	-0.194	(0.030)	0.374	(0.110)
MA	0.12	0.14	-0.495	(0.023)	0.081	(0.013)	-0.446	(0.021)	0.352	(0.062)
MN	0.06	0.08	-0.251	(0.029)	0.137	(0.031)	-0.233	(0.027)	0.844	(0.152)
NC	0.10	0.14	-0.701	(0.019)	0.101	(0.012)	-0.663	(0.018)	0.847	(0.121)
WI	0.07	0.09	-0.505	(0.026)	0.089	(0.018)	-0.484	(0.025)	1.032	(0.213)
WV	0.01	0.01	-0.107	(0.069)	0.001	(0.005)	-0.105	(0.068)	0.029	(0.182)

Note: parameter standard errors in parentheses.

Table 12: Effect size and Heterogeneity Parameters for FRPL vs. Not FRPL in reading scores for grade 8

	Rates of focal group		For use with Optimal Design				For use with CRT Power			
	Overall	Model	Effect size		Effect size variance		Effect size		Omega ratio	
AZ	0.54	0.54	-0.192	(0.012)	0.026	(0.005)	-0.186	(0.012)	0.392	(0.073)
CO	0.39	0.39	-0.591	(0.017)	0.065	(0.008)	-0.549	(0.016)	0.411	(0.061)
IL	0.51	0.51	-0.307	(0.009)	0.036	(0.005)	-0.176	(0.006)	0.018	(0.003)
KY	0.54	0.54	-0.555	(0.016)	0.037	(0.006)	-0.529	(0.015)	0.358	(0.061)
LA	0.70	0.70	-0.357	(0.012)	0.009	(0.004)	-0.325	(0.011)	0.046	(0.021)
MA	0.32	0.32	-0.585	(0.016)	0.057	(0.007)	-0.536	(0.015)	0.296	(0.045)
MN	0.36	0.36	-0.299	(0.017)	0.107	(0.014)	-0.289	(0.016)	1.401	(0.159)
NC	0.48	0.48	-0.682	(0.013)	0.068	(0.006)	-0.640	(0.013)	0.496	(0.057)
WI	0.36	0.36	-0.588	(0.015)	0.052	(0.007)	-0.561	(0.014)	0.532	(0.086)
WV	0.52	0.52	-0.416	(0.016)	0.004	(0.004)	-0.411	(0.015)	0.167	(0.159)

Note: parameter standard errors in parentheses.